

# UK Patent Application

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(56) Documents cited  
GB 1222141 A EP 0336526 A1 US 4829985 A

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INT CL<sup>5</sup> A61B  
Online databases: WPI, MEDENG

(54) A device for Internal mammary artery dissection

(57) This device for Internal Mammary Artery (IMA) dissection has a rounded longitudinal bar, two adjustable bolts and two hooked sternal blades. The device is used (Fig. 4) with the aid of a medium or a large sized Finochietto self-retaining chest retractor. The parts can be easily assembled just before using the device for IMA dissection. Similarly, the parts can be easily dismantled after use for cleaning and sterilization.

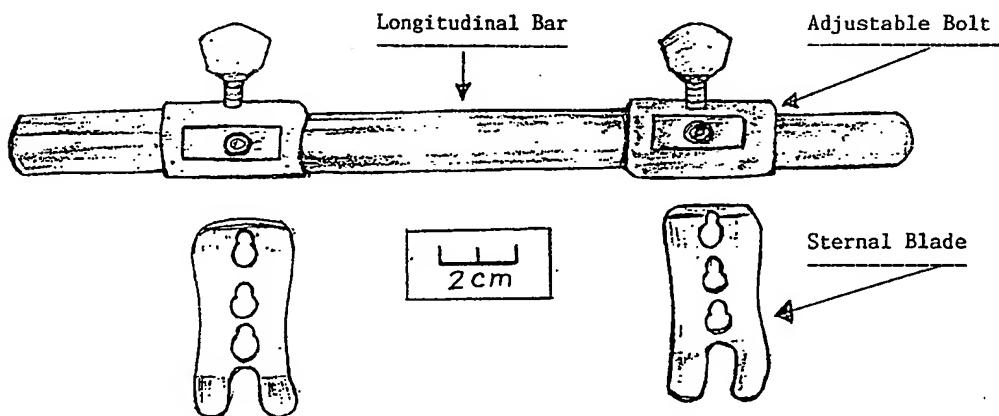
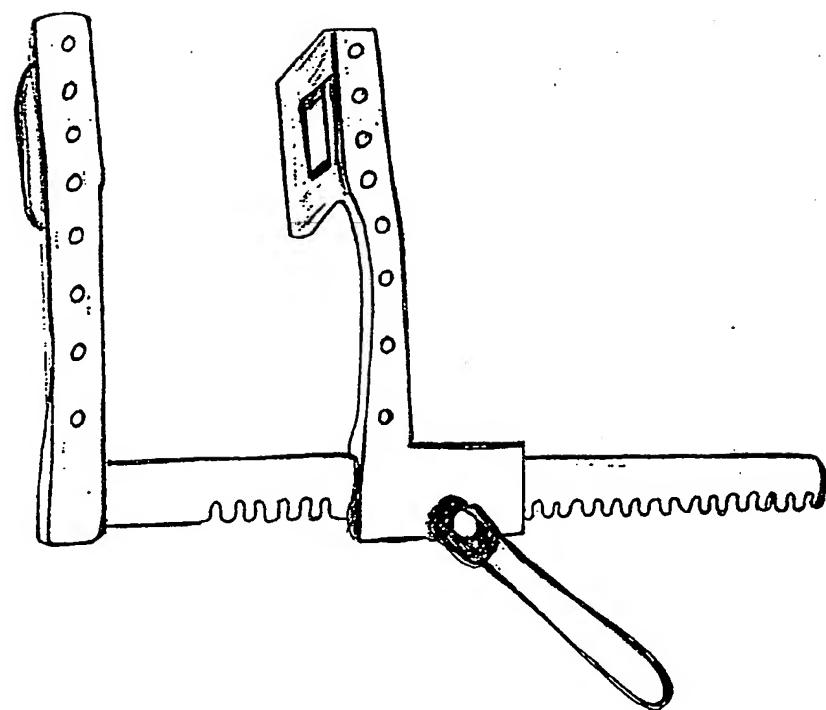


Figure - 2

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Figure - 1



Finochietto Retractor

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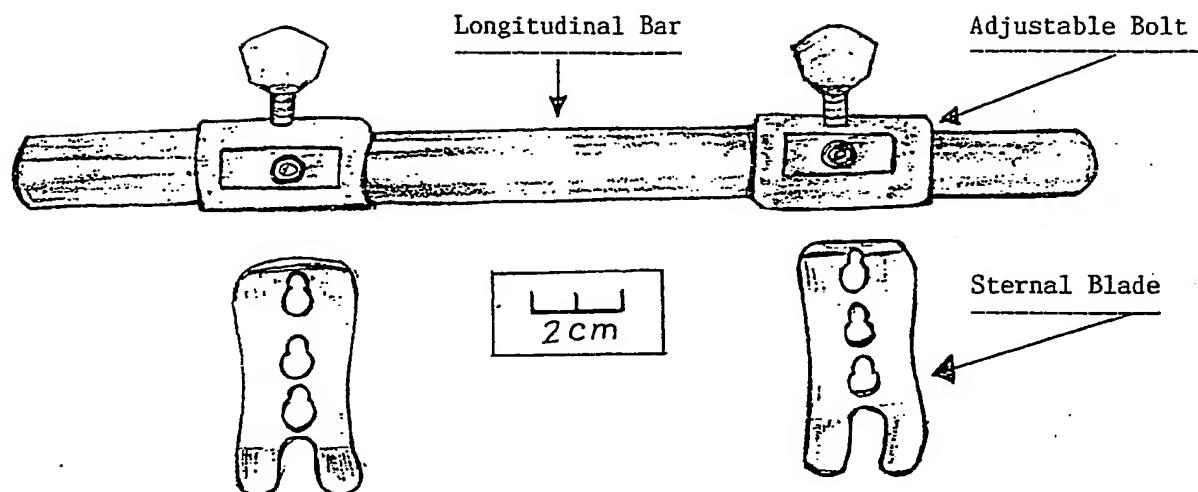


Figure - 2

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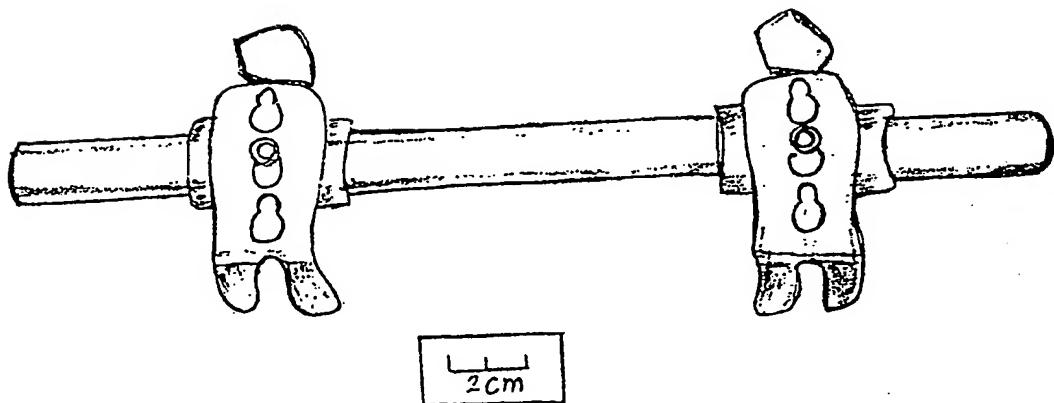
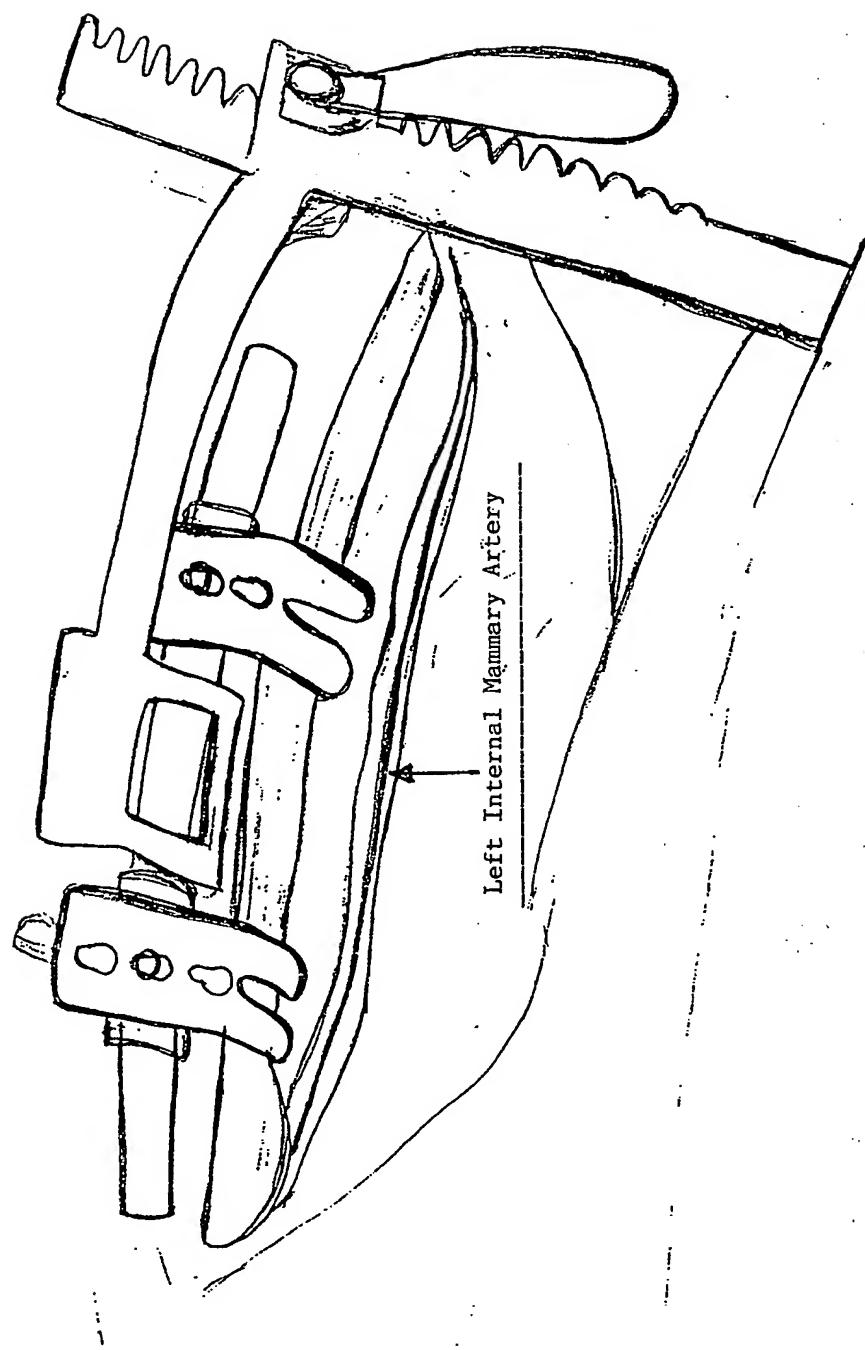


Figure - 3

Figure - 4



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## A Device for Internal Mammary Artery Dissection

Internal mammary artery (IMA) is now routinely used as a vascular conduit during coronary artery bypass grafting (CABG). There are two internal mammary arteries and each arises from the subclavian artery in the neck and courses downwards along the side of the sternum (i.e., the chest bone), upto the level of the diaphragm ( the muscular partition between the chest and abdominal cavities), where it divides into superior epigastric and musculophrenic arteries. During CABG, the entire length of IMA from origin to its bifurcation requires dissection either in one or both sides. For this, the exposure of the undersurface of the sternum is essential and this can be facilitated by the use of a special device. This new invention comprises one such device which can be used for this purpose.

The device is used with the aid of a medium or a large sized Finochietto self retaining retractor (figure 1) available with other surgical instruments used during cardiac operations. It consists of a rounded longitudinal bar, measuring approximately 24cm. long, two adjustable bolts and two hooked sternal blades (figure 2). The bar stays outside along the edge of the hemisternum. The bolts can be moved along the bar and usually placed one at the manubrium and the other at the lower part of the body of the sternum and loosely secured to the bar. The flat part of each sternal blade is slightly concave outwards and fenestrated with holes so that the blade can be easily slotted into the bolts once they are in position with the bar and its hooked end can now be engaged under the inner table of the sternum (figure 3).

Once the device in place, one of the sternal blades of the ordinary Finochietto retractor is slided under the bar in between the bolts with the other blade been placed to the opposite hemisternum in the usual manner. On opening the Finochietto retractor, the hemisternum is elevated upwards

and laterally due to oblique tractional pull on the bar and thus exposing the undersurface of the sternum to surgeon's view(figure 4). The device does not cause any external compression on heart, therefore, cardiac hemodynamics are not compromised due to retraction of the sternum.

Figure 1 - shows a medium sized Finochietto self-retaining chest retractor in half-opened position.

Figure 2 - illustrates the new device; two adjustable bolts are secured to the rounded longitudinal bar and the detachable sternal blades are shown below.

Figure 3 - shows that the sternal blades are slotted to the bolts on the bar and the devive is now ready for use.

Figure 4 - illustrates that the device is positioned on the chest wall with hooked sternal blades engaged under left hemisternum; one of the blades of the Finochietto retractor is slided under the bar between the bolts with the other blade been placed to the opposite hemisternum. The undersurface of the left hemisternum is exposed to surgeon's view on opening the retractor. The left internal mammary artery (IMA) which has been dissected from the chest wall, is also shown here.

## **CLAIMS**

The advantage of this retractor is its easiness to use and handling. Further, during its use, cardiac hemodynamics are not compromised, as the device does not cause any external compression on the heart. The device can be re-used in a similar fashion for dissecting the contralateral IMA and as the parts of the device are removable, these can be easily cleaned and sterilized.

## **Amendments to the claims have been filed as follows**

1. The device for internal mammary artery (IMA) dissection, comprising a rounded longitudinal bar, two adjustable bolts and two detachable sternal blades, means that the adjustable bolts can be slided along the bar and secured to the bar at desired locations.
2. Once the bolts are positioned as in claim 1, the sternal blades can be easily slotted into the bolts with one of the holes in their flat parts and the hooked ends engaged under the sternum.
3. The device for IMA dissection thus assembled as in claims 1 & 2, can now be readily used with the aid of an ordinary Finochietto retractor (Fig - 4), as previously described in the section of essential technical features.
4. While in use, the device does not cause any external compression on the heart, therefore, cardiac hemodynamics are not compromised during retraction of the sternum.
5. Further, the device can be re-used in a similar fashion for dissecting the contralateral IMA.
6. This is a device which can be easily handled and as the parts of the device are detachable, these can be easily cleaned and sterilized.

Patents Act 1977  
Examiner's report to the Comptroller under  
Section 17 (The Search Report)

-5-

Application number

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Relevant Technical fields	Search Examiner
(i) UK CI (Edition L ) A5R (REY)	MISS M M KELMAN
(ii) Int CI (Edition 5 ) A61B	
Databases (see over)	Date of Search
(i) UK Patent Office	31 JULY 1993
(ii) ONLINE DATABASES: WPI, MEDENG	

Documents considered relevant following a search in respect of claims 1 TO 6

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
Y	GB 1222141 A (YAMAMOTO) - see Figures 1, 3a and 3d	1 and 3 to 6
Y	EP 0336526 A1 (PHILLIPS) - see Figures 1, 3, 6, 8 and 9	1 and 3 to 6
Y	US 4829985 A (COUETIL) - see Figure 1	1 and 4 to 6

Category	Identity of document and relevant passages	Relevant to claim(s)

#### Categories of documents

X: Document indicating lack of novelty or of inventive step.

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